

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>P20068PC00</b>	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. <b>PCT/AU2004/000829</b>	International filing date ( <i>day/month/year</i> ) <b>24 June 2004</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) <b>18 July 2003</b>
Applicant <b>VENTRACOR LIMITED et al</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of **7** sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

#### Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II).
3. ☐ **Unity of invention is lacking** (See Box No. III).
4. With regard to the **title**,
 

☒ the text is approved as submitted by the applicant.  
☐ the text has been established by this Authority to read as follows:
5. With regard to the **abstract**,
 

☐ the text is approved as submitted by the applicant.  
☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the **drawings**,
 

- a. the figure of the **drawings** to be published with the abstract is Figure No. **2**

☐ as suggested by the applicant.  
☒ as selected by this Authority, because the applicant failed to suggest a figure.  
☐ as selected by this Authority, because this figure better characterizes the invention.
  - b. ☐ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2004/000829

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

See Extra Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: III**

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

1. Claims 1 to 9 define an implantable device of a cuff positioned to contact the outer surface of a tubular body carrying blood and a pressure sensor within the cuff. It is considered that a cuff implanted about a blood vessel having a pressure sensor comprises a first "special technical feature".
2. Claims 10 to 16 define a system for controlling an implantable blood pump having a pressure sensor for measuring blood flow at the inlet to the pump and a controller connected to the sensor that estimates the current pumping state of the heart from a minimum of the measured pressure and adjusts the speed of the pump. It is considered that such a controller and sensor arrangement comprises a second special technical feature.

Since the abovementioned groups of claims do not share any of the technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept, a priori.

**Box No. IV Text of the Abstract (Continuation of item 5 of the first sheet)**

An implantable device including a cuff (8) positioned to contact the outer surface of a tubular body (9) carrying blood. A sensor (13) to measure blood pressure is encapsulated within the cuff. The device does not occlude or adversely affect the flow or blood pressure within a patient's circulatory system. Also disclosed is a system to control an implantable blood pump using a pressure based on a pressure measurement of blood flow at the inlet to the pump.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2004/000829

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. <sup>7</sup>: A61B 5/026 A61B 5/0215 A61M 1/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

SEE ELECTRONIC DATABASES CONSULTED

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI JAPIO: blood pressure cuff collar band ring vein vascul arter aort vessel A61B A61M A61N sense transduc flow rate heart condition non-invasive pump vaventric heart outer exterior external surround around implant artifical

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, Y	US 5289821 A (SWARTZ) 1 March 1994 Entire document	1-4, 7 5, 6, 8, 9, 11
X, Y	WO 2001012070 A1 (VASCUSENSE, INC.) 22 February 2001 Figure 18, page 32 line 1 to page 33 line 32.	1-4, 7 5, 6, 8, 9, 11
A	WO 1992015239 A1 (KENSEY NASH CORPORATION) 17 September 1992 Abstract	1
Y	US 6277078 B1 (PORAT et al) 21 August 2001 Figure 10	1-4, 7

☒ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
10 August 2004Date of mailing of the international search report  
17 AUG 2004

Name and mailing address of the ISA/AU

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2004/000829

C (Continuation).

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2002/0183628 A1 (REICH et al) 5 December 2002	1
X Y	JP 2002-224066 A (NIHON UNIVERSITY et al) 13 August 2002 Figures and abstract	10, 12-16 6, 8, 9, 11
X Y	US 6027498 A (MUTCH et al) 22 February 2000 Column 4 lines 35 to 44, claims 2 and 3	10, 12-16 6, 8, 9, 11
X Y	WO 2003015609 A2 (APEX MEDICAL, INC.) 27 February 2003 Pages 3 to 4, 6 to 8, claims	10, 12-16 5, 6, 8, 9, 11
P, X	EP 1354606 A1 (THORATEC CORPORATION) 22 October 2003 Entire document	10, 12-16
P, A	WO 2004028593 A1 (VENTRASSIST PTY LTD) 8 April 2004 Entire document	10
A	US 6066086 A (ANTAKI et al) 23 May 2000	10

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2004/000829

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	5289821						
WO	0112070	AU	13637/99	AU	25772/99	AU	26555/99
		AU	97885/98	EP	1026984	EP	1039831
		EP	1056514	EP	1065978	EP	1210012
		US	5807258	US	5967986	US	5967989
		US	6231516	US	6398734	US	6585763
		WO	9918849	WO	9926530	WO	9942039
		WO	9942176				
WO	9215239	AU	12790/92				
US	6277078	AU	12977/01	WO	0136014		
JP	2002224066						
US	2002183628	WO	02098296				
US	6027498	AU	18873/95	CA	2184992	EP	0904116
		US	5647350	US	5941841	WO	9524936
WO	03015609	US	2003045772				
EP	1354606	US	2003199727				
WO	04028593						
US	6066086	AU	49631/97	CA	2241888	EP	0877633
		US	5888242	WO	9819624		

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX